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EXAMINER	
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ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary	Application No.	Applicant(s)	
	10/024,020	LIU ET AL.	
	Examiner	Art Unit	
	Qutub Ghulamali	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 June 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 10-16, 31-46 and 48-56 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 10-16, 31-46, 48-56 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Acknowledgement

1. This Office Action is responsive to the Remarks/Amendment filed 06/28/2007.
2. The applicant's Amendment of claims 1, 3, 5-7, 10, 12-16, 31, 33, 35-44, 48-50, is hereby acknowledged. The applicant has added new claims 51-56.
3. Applicant's remarks/arguments regarding rejection of claims 1, 39, 40, 42, 43 and 44-46 under 35 U.S.C 102(e) and 35 U.S.C 103(a) have been fully considered but they are not persuasive. The rejection follows:

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000.

Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 1-7, 10-16, 31-43, 47-50, 51 are rejected under 35 U.S.C. 102(e) as being anticipated by Murphy et al (USP 6,628,754).

Regarding claims 1, 51, Murphy discloses a method and an apparatus of retrieving channel characteristics for a discrete multi-tone communication channel having a plurality of bins comprising:

determining and storing on a per bin basis channel frequency response and noise measurements at a first end (Central Office (CO)) of the channel at initialization (the modem 26 and ATU 18 exchange expected transmitter settings during initialization sequence procedure in order to determine what transmission attributes and characteristics (frequency response and noise) of the upstream - from CPE to CO, and downstream – from CO to CPE, are necessary to reach Showtime, as is well known in the ADSL art once the ATU 18 and the modem 26 achieve Showtime, the modem stores the settings of its upstream transmitter as a profile in the modem's 26 memory, similarly the ATU 18 stores the settings of its downstream transmitter as a profile in the ATU's 18 memory) (abstract; col. 2, lines 31-43; col. 6, lines 17-30; col. 7, lines 35-49; col. 13, lines 38-60);

determining and storing a signal-to-noise measurement on a per bin basis at the first end (Central Office (CO)) at show time (the characteristics such as frequency response and signal to noise ratio are stored on a per bin basis) (abstract; col. 5, lines 64-67; col. 6, lines 1-15, 25-33; col. 13, lines); and

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retrieving the determined (measured) (transmission attributes such as frequency response and noise measurements (abstract; col. 6, lines 25-33)) channel frequency response, noise and signal-to-noise measurements at a second end of the channel (CPE) (a fast retrain procedure retrieves attributes at initialization at Showtime) (col. 6, lines 6-16, 17-33; col. 13, lines 42-60; col. 14, lines 15-20, 37-55).

Regarding claims 2, 11, 32 Murphy discloses first end comprises a central office (CO) end, and the second end comprises a customer premise equipment (CPE) end (fig. 1; col. 3, lines 50-60).

As per claims 3, 6, 12, 15, 33, 36, 53 and 55, Murphy discloses the channel is asymmetrical as is inherently implied with the use of ADSL utilizing DMT modulation (col. 3, lines 15-40).

As per claims 4, 13, 34 these claims are analyzed in a similar fashion as claims 2, 11 and 32 as Murphy discloses transmitter to receiver and receiver to transmitter functions in a transceiver embodiment (col. 6, lines 6-16).

Regarding claims 5, 14 and 35, Murphy discloses the channel is non-overlapping (DMT is non-overlapping is inherently implied) (see col. 5, lines 20-33).

As per claims 7, 16, 37 the claims are design related and the xDSL technology can be adapted to a very high bit-rate DSL channel disclosed in Murphy (col. 3, lines 40-54).

As per claim 10, the steps claimed as circuit (apparatus) is nothing more than restating the function of the specific components of the apparatus as claimed and therefore, it would have been obvious, to a person of skill in the art at the time of the

invention, to utilize steps in forming circuit components so as to achieve the desired results of Murphy, considering the aforementioned rejection for the method claim 1 above.

Regarding claims 31, 52 Murphy discloses all limitations of the claim above. Murphy further discloses a computer or other computing device encoding a computer program means for execution by computer (see appendix A) (col. 5, lines 5-15).

As per claims 38 and 41, the channel response at initialization is a program function which can be programmed to represent a normalized complex number (col. 8, lines 44-67).

As to claims 39 and 42, the channel frequency response at initialization is traditionally communicated via the tip and ring of a copper loop in any given telephone circuit configured to transmit specified information over the twisted pair and is inherently implied with the use of telephone circuits.

Regarding claims 40 and 43, Murphy discloses noise measurements at initialization is communicated via the twisted copper pair, the ends of which are traditionally referred to as tip and ring to provide connection to customer line or equipment (see col. 4, lines 30-34; col. 7, lines 45-67).

Regarding claims 47 and 49, the channel can be symmetrical is well known in the art disclosed as prior art of the instant application (see page 2, lines 5-14).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 48, 50, 54 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murphy et al (USP 6,628,754) in view of McFarland et al (USP 6,628,673).

Regarding claims 48, 50, 54 and 56, Murphy discloses all limitations of the claim except does not explicitly disclose channel is overlapping. However, McFarland in a similar field of endeavor discloses channel can overlap (col. 1, lines 44-57; col. 8, lines 23-33). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have channel overlap as disclosed by McFarland in the system on Murphy because due to characteristics of the inverse Fourier Transform the channel appear to overlap even though subcarrier orthogonality is implied.

8. Claims 44, 45 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murphy et al (USP 6,628,754) in view of Zuranski et al (USP 6,263,077).

Regarding claim 44, 45, 46, Murphy discloses all limitations of the claim. Murphy though shows the advantage of data allocation so that the throughput of each sub-channel is maximized by limiting thermal noise and cross talk, except does not explicitly disclose analyzing time dependent changes (noise) in cross talk levels and line

attenuation (fading) at the second end of the channel. Zuranski in a similar field of endeavor discloses analyzer (130) analyze time dependent changes (performs spectral analysis, the analyzer performs FFT and can also perform inverse Fourier transformation, in a first frequency range through an equalizer reducing or attenuating cross talk) in cross talk levels and line attenuation (fading) at the second end of the channel (col. 4, lines 1-2, 30-35, 53-67; col. 5, lines 1-12, 30-40; col. 9, lines 25-30, 31-63; col. 13, lines 18-42). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to analyze time dependent changes (noise or cross talk signal to noise ratio) to maintain line attenuation as taught by Zuranski in the system of Murphy because it can reduce or mitigate the near and far end cross talk noise from data propagated in data rate upstream or downstream of communication signal.

Response to Remarks/Amendments

9. Applicant's remarks (pages 7-10) filed 06/28/2007 have been fully considered but they are not persuasive. Applicant argues (page 7-8) that the prior art to Murphy discloses measurements that are different from the measurement themselves and remarks that Murphy provides no suggestion on how to diagnose customer loop problems, no suggestion that the frequency response, noise and SNR be communicated to the other end. Examiner, respectfully, would like to draw applicant's attention that Murphy throughout discloses transmitter and receiver characteristics that are no different than the limitations of the claim. For example, determining and storing

on a per bin basis channel frequency response and noise measurements at a first end (Central Office (CO)) of the channel at initialization (the modem 26 and ATU 18 exchange expected transmitter settings during initialization sequence procedure in order to determine what transmission attributes and characteristics (frequency response and noise) of the upstream - from CPE to CO, and downstream – from CO to CPE, are necessary to reach Showtime, as is well known in the ADSL art once the ATU 18 and the modem 26 achieve Showtime, the modem stores the settings of its upstream transmitter as a profile in the modem's 26 memory, similarly the ATU 18 stores the settings of its downstream transmitter as a profile in the ATU's 18 memory) (abstract; col. 2, lines 31-43; col. 6, lines 17-30; col. 7, lines 35-49; col. 13, lines 38-60). Murphy further discloses that from these measurements, the modem determines the frequency response of the customer loop including signal-to-noise ratio "SNR" in each bin and hence derives a value for the maximum data throughput for that bin (col. 6, lines 17-33). Based on exchange of measurements in a loop, the modem is able to provide fast retrain by diagnosing transmission characteristics. Applicant further remarks (page 8), that "the applicants send the frequency response, noise and SNR measurements because these data are used to diagnose customer loop problems. See paragraph 29, 45, 46 and 51 of the present published application 20020176544". In response to applicant's remarks, that the reference to Murphy fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., to diagnose customer loop problems) are not recited in the rejected claims. Although the claims are interpreted in light of the specification, limitations from the specification are

not read into the claims. See *In re Van Geuns*, 988 F. 2d 1181, 26 USPQ 2d 1057 (Fed. Cir. 1993).

As regards to applicant's remarks that no reason or motivation to combine, it is reminded to the applicant that the strongest rationale for combining references is a recognition, expressly or implied in the prior art or drawn from a convincing line of reasoning based on established scientific principles or legal precedent, that some advantage or expected beneficial result would have been produced by their combination. In *re Sernaker*, 702 F. 2d 989, 994-995, 217 USPQ 1, 5-6 (Fed. Cir. 1983), in this case, Murphy disclose the measurement and use of noise and SNR to diagnose loop problem as a retrain procedure. The examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produced the claimed invention where there is some teaching, suggestion or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F. 2d 1071, 5 USPQ 2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F. 2d 347, 21 USPQ 2d 1941 (Fed. Cir. 1992). In this case the transmitter settings between the modems allows frequency response measurement such as noise and cross talk (SNR) of the customer loop and modem determine the data carrying capacity of each subchannel.

Regarding applicant's remarks (page 10) that before references may be combined to render a claimed inventions obvious, there must be some suggestion or motivation found in the art to make the combination. In rejecting claims under 35 U.S.C. § 103, the examiner bears the initial burden of presenting a prima facie case of obviousness. See

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In re Rilckaert, 9 F. 3d 1531, 1532, 28 USPQ 2d 1955, 1956 (Fed. Cir. 1993) and in re Fine, 837 F. 2d 1071, 1074, 5 USPQ 2d 1596, 1598 (Fed. Cir. 1988). A prima facie case of obviousness is established by presenting evidence that the reference teachings would appear to have suggested the claimed subject matter to one of ordinary skill in the art. See In re Bell, 991 F. 2d 781,783, 26 USPQ d 1529, 1531 (Fed. Cir. 1993); In re Fritch, 972 F. 2d 1260, 1266 n.14, 23 USPQ 2d 1780, 1783-84 n.14 (Fed. Cir. 1992); Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F. 2d 1044, 1051,5 USPQ 2d 1434, 1438 (Fed. Cir. 1988); Ashland Oil, Inc. v. Delta Resins & Refractories Inc, 776 F. 2d 281,293, 227 USPQ 657, 664 (Fed. Cir. 1985). It also cannot show non-obviousness by attacking references individually where, as here the rejections are based on combination of reference. In re Keller, 208 USPQ 871 (CCPA 181).

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qutub Ghulamali whose telephone number is (571) 272-3014. The examiner can normally be reached on Monday-Friday, 7:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

QG.

September 17, 2007.


CHIEH M. FAN
SUPERVISORY PATENT EXAMINER